

REMARKS

Claims 1-4, 10 and 14-16 are pending in this application.

In view of the following remarks, reconsideration and allowance are respectfully requested.

I. Double Patenting

The Office Action provisionally rejects claims 1-4, 10 and 14-16 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 14 of U.S. Patent Application No. 10/713,114. Without admitting to the propriety of the rejection, and in the interest of advancing prosecution, Applicants are simultaneously filing herewith a Terminal Disclaimer over the cited reference, thus obviating the rejection. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejection Under 35 U.S.C. §102/§103

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent Application Publication No. 2002/0192552 to Lampe-Onnerud et al. ("Lampe-Onnerud"). Applicants respectfully traverse the rejection.

Claim 1 recites, "A positive electrode material powder for a lithium secondary battery containing a Li-Ni-Co-Ba-O system component as a main component, wherein each particle which constitutes the powder has an amorphous phase of an oxide; wherein the amount of Ba in the system component is 0.0005 to 0.007 mol ratio; wherein the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0." (Emphasis added.) Applicants respectfully assert that Lampe-Onnerud does not anticipate, and would not have rendered obvious, each and every feature of claim 1.

The Office Action asserts, "EXAMPLES 6-11 [of Lampe-Onnerud] specifically used Mg in the mol amount of 0.01. Since elements A is [at] least one element selected from the group consisting of barium (Ba), magnesium (Mg), among others, these two elements can be interchangeably used in the aforementioned chemical formula, and thus, barium (Ba) can be used in that chemical formula in the same amount that magnesium (Mg) is used. In short, the mol amount of element A including barium (Ba) or magnesium (Mg), among others, in that chemical formula is 0.01 as instantly claimed." Office Action, page 5 (emphasis added.) However, claim 1 recites that the amount of Ba in the system component is 0.0005 to 0.007 mol ratio. Therefore, even if the amount of Mg as disclosed in Examples 6-11 of Lampe-Onnerud was substituted with Ba as suggested in the Office Action, it would still yield Ba in an amount of 0.01, which is approximately 42% above the maximum of the claimed range. Therefore, Applicants respectfully assert that Lampe-Onnerud does not disclose Mg within the claimed range, much less Ba, and thus does not anticipate the claimed invention.

Similarly, Examples 6-11 disclose Mn in an amount of 0.05 or 0.03, both of which are above the claimed maximum of 0.01. Thus, Lampe-Onnerud also does not disclose the claimed amount of Mn, and thus further does not anticipate the claimed invention.

Furthermore, the Office Action asserts that Lampe-Onnerud "clearly envisages the use of any one of the elements A and elements B because both groups of elements A and B contain only a limited number of disclosed elements (i.e. elements A: a group of 4 elements; and elements B: a group of 7 elements)." Office Action, page 6 (emphasis added). Applicants respectfully disagree.

Applicants have repeatedly argued throughout prosecution that the composition and ranges described in Lampe-Onnerud are too broad to support a prima facie case of obviousness. MPEP 2144.05 states "if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a

situation analogous to the obviousness of a species when the prior art broadly discloses a genus." MPEP 2144.08 cites to *In re Baird*, 16 F.3d 380, 382 29 USPQ2d 1550, 1552 (Fed. Cir. 1994), which states "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does *not* by itself render that compound obvious" (emphasis added). Lampe-Onnerud's formula provides an extremely large number of possible distinct compositions, and thus it would not have been obvious for a person skilled in the art to select Applicants' specific claimed compositions from Lampe-Onnerud's broad disclosure.

Examples 6-11 of Lampe-Onnerud do *not* disclose a compound within the scope of the presently claimed invention. Instead, as the Office Action describes on page 5, the compounds of Examples 6-11 must allegedly be *substituted with two very specific compounds* and then *the weight ranges thereof varied*. Specifically, Mg and Mn in Examples 6-11 must be exchanged for Ba and Al respectively, *and* even then, the weight range of Ba must be varied from the 0.01 value taught by Lampe-Onnerud to at least the maximum claimed value of 0.007. Therefore, Applicants respectfully submit that the citation to Examples 6-11 of Lampe-Onnerud does *not* refute Applicants' arguments regarding the very broad disclosure of Lampe-Onnerud.

Specifically, the Office Action also alleges that four elements of A and seven elements of B are a small number of elements that one would envisage a combination of Al and Ba. Applicants respectfully traverse this allegation, on the grounds that this analysis does not take into account the full spectrum of compounds taught by Lampe-Onnerud. Lampe-Onnerud teaches that "A is at least one element selected from" four possibilities (emphasis added), and that "B is at least one element selected from" seven possibilities. See Lampe-Onnerud, Abstract (emphasis added). Therefore, the total number of combinations encompassed by this disclosure is 1,905.

That the total number of species encompassed by Lampe-Onnerud's teaching is 1,905 can be understood as follows. Looking first at "A," the number of possible combinations for A is 15. Specifically, there are four combinations of one element, six combinations of two elements, four combinations of three elements and one combination of all four elements ($4+6+4+1 = 15$). Turning now to B, the number of possible combinations is 127. Specifically, there are seven combinations of one element, 21 combinations of two elements, 35 combinations of three elements, 35 combinations of four elements, 21 combinations of five elements, seven combinations of six elements, and one combination of seven elements ($7+21+35+35+21+7+1 = 127$). Therefore, the total number of combinations between A and B is $15 * 127 = 1,905$.

Therefore, Lampe-Onnerud does *not* teach a small number of elements, as the Office Action alleges, but instead teaches nearly 2,000 possible combinations of elements. From these nearly 2,000 species taught by Lampe-Onnerud, the Office Action uses the present disclosure to select one very particular species, and alleges that a person of ordinary skill in the art would have envisaged this particular species. Applicants respectfully submit that this allegation has no basis in either the applied references or in the skill of a person having ordinary skill in the art. Instead, Lampe-Onnerud's teachings are "broad as to encompass a very large number of possible distinct compositions" just as in *In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005), discussed in MPEP 2144.05. Therefore, "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does *not* by itself render that compound obvious." Thus, *no* prima facie case of obviousness is made by the nearly 2,000 possible species taught by Lampe-Onnerud.

Still further, even once a specific combination in Lampe-Onnerud is selected, specific amounts of each element must thereafter be selected. Even within the broad disclosed ranges of the reference, this leads to an almost infinite number of specific combinations, none of

which correspond to the claimed compounds as discussed above. Instead, one of ordinary skill in the art would have to first select one specific combination from the reference, and then still adjust the content to be outside of the disclosed range. Lampe-Onnerud simply provides no reason or rationale to make these selections and adjustments.

Lampe-Onnerud does not anticipate, and would not have rendered obvious claim 1. Claims 3-4, 10 and 14-16 variously depend from claim 1 and, thus, also are not anticipated by and would not have been rendered obvious by Lampe-Onnerud. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Rejection Under 35 U.S.C. §103

A. Yasuda, JP '277 and AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over EP 0 849 817 to Yasuda ("Yasuda") in view of Applicants' Alleged Admission of Prior Art (hereinafter "AAPA") and rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over JP 06-275277 ("JP '277") in view of AAPA. Applicants respectfully traverse the rejection.

The Office Action, on page 8, acknowledges that Yasuda "neither explicitly discloses the Ba component nor the specific amount of the amorphous phase." The Office Action further acknowledges, on page 12, that JP '277 "neither explicitly discloses the Ba component nor the specific amount of the amorphous phase." Thus, the Office Action acknowledges that neither Yasuda nor JP '277 disclose the Ba component as recited in claim 1.

To allegedly address the discrepancies of both Yasuda and JP '277, the Office Action applies the disclosure of AAPA. To address the discrepancies of both Yasuda and JP '277, the Office Action asserts that AAPA presents different publications teaching positive electrode materials for lithium secondary batteries with Li-Ni-Co-O or Li-Ni-Co-Ba-O system compositions, and that Ba may be present in the range from 0 to 0.01. See Office Action, pages 8 and 13. The Office Action therefore asserts that it would have been obvious to have

combined the disclosures of Yasuda and JP '277 with the AAPA to yield the composition of the electrode material as recited in claim 1.

However, it is not enough for the Office Action to merely allege that two or more references can be combined to yield a claimed invention, the Office Action must provide some reason or rationale why one of ordinary skill in the art, at the time of invention, would have wanted to combine the composition containing Ba as disclosed in AAPA with the compositions disclosed in either Yasuda or JP '277. See MPEP §2143.01(III), which states that "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination." See also the conclusion of the Patent Office's May 3, 2007 Memorandum regarding the Federal Circuit's *KSR Int'l. Co.v. Teleflex, Inc.* decision, which states, "it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed." The Office Action does not assert that the AAPA, Yasuda or JP '277 provide any reason or rationale for one of ordinary skill in the art to have modified the compositions of either Yasuda or JP '277 to include Ba. The Office Action merely makes the conclusory statement that "[i]f a technique has been used to improve one material or product ... and a person of ordinary skill in the art would recognize that it would improve similar materials or produces the same way ... using the known technique is obvious unless its actual application is beyond his or her skill." However, the Office Action does not provide any portion of the AAPA that discloses any benefits of adding Ba within the claimed amount, or any other amount for that matter, to a Li-Ni-Co-M-O structure (Applicants respectfully assert that AAPA is the only reference cited by the Office Action that discloses the use of Ba and, thus, even though it is only one reference in the combination, it is the only reference of all three applied references that would provide any reason or rationale to include Ba in the

Li-Ni-Co-M-O structure). Therefore, the applied references fail to provide any reason or rationale to combine the applied references as suggested in the Office Action.

The Office Action does provide a reason or rationale to combine the AAPA and Yasuda or JP '277. The Office Action asserts, "it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to add the Ba component of the AAPA to the amorphous positive electrode material of JP '277 [page 14 of the Office Action or Yasuda on page 10 of the Office Action] as it is known in the art that that [sic] Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's [sic] specification at page 4, last full paragraph); particularly, such arrangement allows the production of a positive electrode material for a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's [sic] specification at page 6, last full paragraph, item-3). Thus, the addition of Ba to the amorphous material of the JP '277 [on page 14 of the Office Action or Yasuda on page 10 of the Office Action] enhances the amorphousness of that material." Office Action, pages 10 and 14. The Background of the Invention section of Applicants' specification ends on the bottom of page 3. Therefore, as quoted above, the Office Action asserts that the Applicants' own findings, as disclosed in their own specification, provides the reason or rationale to combine AAPA and Yasuda or JP '277. Applicants respectfully assert that this is *per se* impermissible use of hindsight reasoning. The Office Action is using Applicants' own disclosure against them as providing a reason or rationale to combine the applied references asserted in the Office Action.

The Office Action responds to Applicants' similar arguments made previously by responding that "it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed

invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such reconstruction is proper." However, Applicants assert that when Applicants' own specification is cited as providing a reason or rationale to combine the applied references, this gleans knowledge only from the Applicant's disclosure. The Office Action does not anywhere recite a reason or rationale from the references for including Ba in the Li-Ni-Co-M-O structures of Yasuda and JP '277, as recited in claim 1, and, thus, the Office Action does not meet its burden of proving a *prima facie* case of obviousness. Accordingly, Applicants respectfully assert that, without the reason and rationale that is recited in the Applicants' own specification, it would not have been obvious to one of ordinary skill in the art at the time of invention to have combined AAPA and Yasuda or JP '277 as suggested in the Office Action.

The Office Action also asserts that the presence of unexpected results cannot be shown by TABLE 2, Examples 1-4, 7-8, 10, 18 and 19 and TABLE 3, Examples 11-12, 14, 16 because allegedly none of the examples include oxygen in its total composition. Hence, the Office Action asserts the above Example do not represent an amorphous phase of an oxide as recited in claimed invention.

However, Applicants respectfully assert that this position is directly contradictory to the specification. The specification is replete with recitations and examples that clearly indicate the importance of an amorphous oxide layer. For example, page 4 of the specification recites, "the present invention is a positive electrode material powder for a lithium secondary battery, wherein the particle has an amorphous phase of an oxide dispersed within the particle;" "the present invention is a positive electrode material powder for a lithium secondary battery, wherein the particle has an amorphous phase of an oxide formed on a surface of the particle;" and "the present invention is a positive electrode material powder for a lithium secondary battery, wherein the particle has an amorphous phase of an

oxide dispersed within the particle and formed on a surface of the particle." Specification page 4, second - fourth paragraphs. Therefore, it is clearly indicated that the invention is intended to comprise an amorphous phase oxide associated in some fashion with the particle. Applicants respectfully assert that it would be incongruous with the specification if the examples that are clearly intended to embody the claimed invention did not include features that are clearly recited in the rest of the specification as important features of the claimed invention and, thus, the examples in TABLES 2 and 3 were merely erroneously written without the oxygen component.

Further, regarding the Examples of the specification themselves, the specification recites, "The amount of an amorphous phase of an oxide is set to below 0.01 mol. However, zero is not included. ... It is necessary for an amorphous phase of an oxide to be present within a particle of a material powder of the present invention or at the surface thereof. Accordingly, zero is not included." Specification, pages 9-10, carryover paragraph. This portion of the specification clearly indicates that an amorphous phase of an oxide is "necessary," and thus, it would be contrary to the disclosure of the specification to formulate examples that do not include this "necessary" amorphous phase of an oxide.

Also, the specification clearly recites that elements such as Li, Na, K, Si, Ba, B, P, and Al are elements that produce an amorphous phase of an oxide. See specification, page 8, first full paragraph. When describing how the amorphous phase of an oxide is formed, the specification recites, "[A] component for forming an amorphous phase of an oxide composed of one or plural elements selected from the group consisting of Li, Na, K, Si, Ba, B, P, and Al is mixed at an extremely small amount of below 0.01 mol. into a Li-Ni-Co-O or Li-Ni-Co-Ba-O system raw material. Firing the resulting mixture allows production of a positive electrode material for a lithium secondary battery having an amorphous phase of an oxide within each of particles." Specification, page 10, first full paragraph.

Furthermore, the specification recites that Examples 1-10 and 17-19 were made by adding Ni and Co sources, with the claimed molar ratios, together with other raw materials, such as: $\text{LiOH}^+\text{H}_2\text{O}$ as the Li source; NaNO_3 as the Na source; KNO_3 as the K source; $\text{Ba}(\text{NO}_3)_2$ as the Ba source; H_3BO_3 as the B source; Al_2O_3 as the Al source; SiO_2 as the Si source; and P_2O_5 as the P source. These components are then fired and cooled. See specification pages 12-13. Thus, the preparation of these Examples includes the elements that produce an amorphous phase of an oxide, and the process (i.e., firing and cooling) disclosed to produce the amorphous phase of an oxide. Therefore, one of ordinary skill in the art would have known that an amorphous phase of an oxide is inherently included in the results recorded in the Tables for these Examples, even if not explicitly stated.

Additionally, regarding Examples 11-16, the specification recites, "In Examples 11, 13, 14, and 15, an amorphous phase of an oxide is formed on the surface of each of particles. In Examples 12 and 16, an amorphous phase of an oxide is formed within each of particles and on the surface thereof. Table 3 shows the respective average particle diameters and molar ratios of the individual elements measured by laser diffraction and chemical analysis, respectively." Specification, page 18.

Therefore, for all the reasons stated above, Applicants respectfully request that the Examiner consider the examples disclosed in TABLES 2 and 3 of the specification as exemplary embodiments of the invention including an amorphous phase oxide, as recited in claim 1.

Furthermore, although the Examples are specifically defined compositions that do not disclose every possible combination of the claimed invention, this is necessarily the case with exemplary embodiments. Applicants cannot be expected or required to prepare an example for every possible claimed combination. Applicants respectfully submit that the examples provided in TABLES 2-4 provide examples with Ba from 0.001 to 0.007, which encompasses

the vast majority of the claimed range. Further, the examples show an amorphous phase from 0.0001 to 0.09, which, again, encompasses the vast majority of the claimed range. These examples are compared to examples without Ba and without an additional metal amorphous phase with amounts that are at or near the claimed range. The comparative examples do not perform nearly as well as the examples according to claim 1. Thus, Applicants respectfully assert that the examples of the specification do contain oxygen and show unexpected results when compared to similar components that fall just outside of the claimed range.

For at least the reasons stated above, claim 1 would not have been rendered obvious by Yasuda and AAPA, or JP '277 and AAPA, individually or in any combination. Claims 3-4, 10 and 14-16 variously depend from claim 1 and, thus, also would not have been rendered obvious by Yasuda and AAPA, or JP '277 and AAPA, individually or in any combination. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time
Terminal Disclaimer

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